

INDIRECT MEASUREMENT OF DILUENTS
IN A MULTI-COMPONENT NATURAL GAS

ABSTRACT

A method of indirectly measuring the diluent
(nitrogen and carbon dioxide) concentrations in a natural
gas mixture. The molecular weight of the gas is modeled
5 as a function of the speed of sound in the gas, the
diluent concentrations in the gas, and constant values,
resulting in a model equation. A set of reference gas
mixtures with known molecular weights and diluent
concentrations is used to calculate the constant values.
10 For the gas in question, if the speed of sound in the gas
is measured at three states, the three resulting
expressions of molecular weight can be solved for the
nitrogen and carbon dioxide concentrations in the gas
mixture.